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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/574,184

03/30/2006

Gary A. Schwartz

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EXAMINER

LEACH, CRYSTAL I

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

09/16/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/574,184	Applicant(s) SCHWARTZ, GARY A.	
	Examiner CRYSTAL I. LEACH	Art Unit 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/30/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/30/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The Information Disclosure Statements (IDS) submitted on March 30, 2006 is in compliance with 37 CFR 1.97 and 1.98. The references therein have been considered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9, 11, 12-19 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Mine (6,374,674).

4. Regarding claim 1-9, 11, 12-19 and 21-22, Mine teaches an ultrasonic diagnostic imaging system for three dimensional scanning comprising: an array transducer having a plurality of transducer elements (see col. 4, l. 39-44 and fig. 1); a beamformer (see col. 4, l. 60) coupled to the array transducer which causes the transducer to scan a volumetric region with a plurality of transmit beams and to receive echo information in response to transmit beams (see col. 12, l. 7), the beamformer controlling the point spread functions of beams transmitted and/or received (see col. 4, l. 55-59; col. 10, l. 63 – col. 11, l. 1 where the aperture and aperture function is modified) since the aperture function is the Fourier transform of the point spread function. The device of Mine also teaches an image processor (28, 38) coupled to the beamformer which produces image signals in response to the echo information; and a display (48) coupled to the image

processor. From col. 5, l. 25-55 and fig. 2a-2b, it is apparent that the device has two mode: a narrow beam mode for producing a fine image of high sensitivity and high raster density (col. 6, l. 41-44, Fig. 2b) and a wide beam mode with lower raster density in order to maintain a 20Hz frame rate (see col. 6, l. 36-41, Fig. 2a). Since the aperture size and weighting function (aperture function) is modified according to which mode the device is in (ass col. 4, l. 55-59; col. 10, l. 63 – col. 11, l. 1), it is apparent that the point spread function (i.e. the Fourier transform of the aperture function) is modified according to the mode chosen, including also the raster density or number of lines. Mine also teaches a weighting function of the aperture (see col. 10, l. 64) which is also known taken to be an apodization. Examiner notes that the sampling theorem by Nyquist states that a signal must be sampled at least twice its bandwidth in order to keep the information of the signal. It is commonly known that in utilizing Nyquist, the lines followed by a scanning beam must not lie too far apart in order to avoid undersampling, therefore, dictating a match of the beam size to the distance between the lines of the scanning system. Therefore, matching the ultrasonic beam point spread function (which reflects the beam size) to the line density (which reflects the interline distance) is a well known technique. See also col. 5, l. 1 – col. 6, l. 67 and col. 9, l. 1 – col. 10, l. 11 and claims 1-4 and 11.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10, 13 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mine (6,374,674) in view of Haider (6,282,963).

Mine teaches a weighting function of the aperture which is seen to be an apodization.

Haider further defines and utilizes apodization (see abstract).

It would be obvious to one of ordinary skill in the art that apodization as taught by Haider could be used to further define the apodization technique of Mine.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cooley et al. (6,494,838) teach an ultrasonic diagnostic imaging with interpolation; Dreschel et al. (5,671,746) teach an elevation steerable ultrasound transducer array.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRYSTAL I. LEACH whose telephone number is (571)272-5211. The examiner can normally be reached on Monday through Friday, 8 am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner, Art
Unit 3737

/Crystal I Leach/
Examiner, Art Unit 3737